

Self-study Problems #8: Oldowan toolmakers and early *Homo*

1. Describe an Oldowan tool.

a small hand-sized cobble with a few flakes broken off to make cutting edges

2. What is a core tool?

the useful sharp rock left behind when flakes are broken off of it, as opposed to the flakes themselves

3. Discuss the question of which hominin made the Oldowan tools of about 2.5 mya.

*Several species of australopithecines and paranthropines are known to have lived at this time. There might also have been yet unknown early members of the genus *Homo* or yet unknown descendents of *Kenyanthropus platyops*. So there are numerous possible toolmaking species. We can't clearly pick among them because tools are often found without hominin bones, and when they are found with hominin bones, we can't be sure whether those bones were the toolmakers or the prey.*

4. How does the genus *Homo* differ in life history strategy from earlier hominins?

It has more of a slow, long, large life history strategy than did the earlier hominins.

5. How might a shift towards complex foraging have led to basic characteristics of the genus *Homo*?

It would have required more learning and flexible behavior, encouraging a larger brain and longer juvenile development period to grow that brain and learn complex techniques. Long juvenile dependency would have encouraged longer adult life, and the larger body size typically found in longer-lived animals. It would have encouraged sharing between male hunting specialists and female gathering specialists, between experienced older foragers and less productive younger ones, and between hunters to reduce the risk of going through a long period without meat. All this sharing would have worked best with reduced male-male competition and thus reduced sexual dimorphism.

6. What evidence suggests that Plio-pleistocene tool-and-bone sites were *not* home bases?

Cutmarks and carnivore marks on the bones indicate that carnivores were there before and after the hominins – not safe places like a home base.

Relatively high proportion of carnivore bone suggests that hominins killed carnivores at these sites, and hominin bones with toothmarks suggests that carnivores killed them – again, not safe places. Different degrees of weathering on the bones suggests that carcasses were butchered at the same place at different times, separated by up to several years. Hominins establishing a home base would probably not return multiple times to exactly the same spot to work and sleep amid old bone garbage. The bones are not broken open for their marrow, suggesting that the meat was cut off in a hurry, rather than fully processing the bones as might happen at a home base.

7. What behaviors of chimps are similar to those proposed for the Oldowan toolmaking hominins?

They bring nuts to the locations of anvil stones or roots in order to break them, similar to dragging a carcass to a stone cache.

When they need a hammerstone to crack nuts, they fetch the nearest one they left in the area, similar to hominins knowing where the nearest stone tool cache would be.

8. Roughly when did the first stone tools appear, and roughly when did the first members of the genus *Homo* appear?

*stone tools: 2.5 mya. genus *Homo*: 1.8 mya*

9. What do we call the first species in the genus *Homo*?

Homo ergaster

10. What is interesting about the geographic distribution of the first species of the genus *Homo*?

It is the earliest hominin known to have moved out of Africa, with fossils found not only in Africa, but also between Europe and Asia, just east of the Black Sea, in Dmanisi, Georgia.

11. Describe some features of the earliest species of *Homo* that make it different from earlier hominins.

*Fully committed biped: longer legs and shorter arms; narrower shoulders and hips
Full modern body size. Lighter, more vertical face. Smaller teeth, especially the back teeth. Huge browridges. Larger brain (800 cc initially, increasing to 1000 cc later), but not much larger relative to body size. Reduced sexual dimorphism. Longer period of juvenile development than australopithecines, but not as long as modern *Homo sapiens*.*

12. Name and describe the stone tools made by *Homo ergaster*.

*At first, mode 1 Oldowan tools, but quickly began making mode 2 Acheulean tools such as handaxes, cleavers, and picks. These are flattish, teardrop shaped tools, flaked all over, with sharp edges all the way around. This produces more cutting edge per pound of stone than Oldowan tools, and indicate that *H. ergaster* made tools to fit a specific pattern in mind. They also used the resulting flakes.*

13. What were Acheulean tools used for?

Hard to say, since no living humans make or use similar tools. Suggestions include butchering animals, working wood, throwing them as weapons, stripping bark to get edible cambium found underneath it, digging for tubers, burrowing animals, or water, or simply as the source of flakes. Use-wear evidence supports the first two, and finding the tools with animal bones also supports butchery.

14. Did *Homo ergaster* control fire?

Maybe. A burned patch of soil at a site with Acheulean tools might indicate a campfire, since natural brushfires and tree fires leave different traces. Also, many animal bones from Acheulean layers at Swartkrans in South Africa show signs of burning at high temperatures typical of campfires. Finally, fire might have been necessary to survive the cold winters of Dmanisi, Georgia.

15. What was the first hominin to reach Asia, and what was it like?

**Homo erectus*. Similar to *H. ergaster*, but apparently did not make Acheulean tools. Probably descended from the first *H. ergaster* to leave Africa, before they started making Acheulean tools. Unlike *H. ergaster*, *H. erectus*'s 800 cc brain size did not increase over time. Survived until just 30,000 years ago. Lived in very cold climate near Beijing, China, but also tropical southeast Asia.*

16. What do the kinds of tools that *Homo ergaster* and *Homo erectus* made suggest about their cognitive abilities?

**H. ergaster* made mode 2 Acheulean tools, starting shortly after they first left Africa. *H. erectus* probably made only mode 1, Oldowan-like stone tools (although finds from the Bose basin of China may indicate that they actually could make Acheulean tools). This suggests that *H. erectus* may have been less intelligent than *H. ergaster*. If so, *H. ergaster* may have made a significant step up in cognitive ability shortly after the first *H. ergaster* population left Africa and some split off towards the east to become *H. erectus*.*

17. List two varieties of the genus *Homo* that probably were our ancestors, and two that probably were not.

Homo ergaster and *Homo heidelbergensis* probably were our ancestors.

Homo erectus and *Homo neanderthalensis* (or just "Neanderthals") probably were not our ancestors.

18. What species or varieties of the genus *Homo* lived in Europe?

H. ergaster, *H. heidelbergensis*, *H. neanderthalensis*, *H. sapiens*

19. What are browridges, and what is thought to be their function?

A protruding bar of bone over the eyes. Apparently stiffen the face to resist bending when the temporal muscles pull down on the side of the head in chewing or holding things in the front teeth.

20. What is a mode 3 tool?

One made by flaking a core to a specific shape in order to produce the desired shape of flake, then reshaping the core in order to remove another, similar flake, and so on until the core used up. The flake is used as-is or modified to become the desired tool.

21. Describe a few key characteristics of *Homo floresiensis*.

Only found on the Indonesian island of Flores. Very small body, about 3 feet tall. Very small cranial capacity, about 380 cc, even smaller than a chimp or australopithecine. Yet found with sophisticated mode 4 tools, previously found only with *Homo sapiens*. May actually be *H. sapiens* individuals with a genetic disorder, rather than a new species.